



Amended 11/13/09

SEQUENCE LISTING

<110> Gijzen, Mark

<120> Soybean Seed Coat Peroxidase Structural Gene And Regulatory Region

<130> 76-105

<140> US 08/939,905

<141> 1996-09-30

<150> US 08/723,414

<151> 1996-09-30

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| atg cat gca ggt ttt tca gtc tct tat gct cag ctt act cct acg ttc | 96 |
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| tac aga gaa aca tgt cca aat ctg ttc cct att gtg ttt gga gta atc | 144 |
| Tyr Arg Glu Thr Cys Pro Asn Leu Phe Pro Ile Val Phe Gly Val Ile | |
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| ctg aac aac act gat aca ata gaa agc gag caa gat gca ctt cca aat Leu Asn Asn Thr Asp Thr Ile Glu Ser Glu Gln Asp Ala Leu Pro Asn 85 90 95 | 288 |
| atc aac tca ata aga gga ttg gac gtt gtc aat gac atc aag aca gcg Ile Asn Ser Ile Arg Gly Leu Asp Val Val Asn Asp Ile Lys Thr Ala 100 105 110 | 336 |
| gtg gaa aat agt tgt cca gac aca gtt tct tgt gct gat att ctt gct Val Glu Asn Ser Cys Pro Asp Thr Val Ser Cys Ala Asp Ile Leu Ala 115 120 125 | 384 |
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| tcc ttt gct gtt caa ggt ctc aac acc ctt gat tta gtt aca ctc tca Ser Phe Ala Val Gln Gly Leu Asn Thr Leu Asp Leu Val Thr Leu Ser 180 185 190 | 576 |
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| tta tac aac ttc agc aac act gga aac cct gat cca act ctg aac aca Leu Tyr Asn Phe Ser Asn Thr Gly Asn Pro Asp Pro Thr Leu Asn Thr 210 215 220 | 672 |
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| att cgc ttg caa tgt aat ttt gtg aat gga gac tcg ttt gga tta gct | 1008 |
| Ile Arg Leu Gln Cys Asn Phe Val Asn Gly Asp Ser Phe Gly Leu Ala | |
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| Ser Val Ala Ser Lys Asp Ala Lys Gln Lys Leu Val Ala Gln Ser Lys | |
| 340 345 350 | |
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| Ser Tyr Ala Gln Leu Thr Pro Thr Phe Tyr Arg Glu Thr Cys Pro Asn | |
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| ctg ttc cct att gtg ttt gga gta atc ttc gat gct tct ttc acc gat | 1697 |
| Leu Phe Pro Ile Val Phe Gly Val Ile Phe Asp Ala Ser Phe Thr Asp | |
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| ccc cga atc ggg gcc agt ctc atg agg ctt cat ttt cat gat tgc ttt | 1745 |
| Pro Arg Ile Gly Ala Ser Leu Met Arg Leu His Phe His Asp Cys Phe | |
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 agaactagat ttagccacca tagcatccat agtagaatca ttagaggatg gtattgctag 1080
 tgtaatataa ataaattagc gtaaattcac ttattgaaat cttgtgacta gatgccacta 1140
 ataaataagt tataactagg cacatttcat gtcacttgaa atttcatgcc tgtatatgag 1200

<210> 13

<211> 1200

<212> DNA

<213> Medicago sativa

<400> 13
 ctcccttagca acttctatgt ggtgtgttgt gcttttagtt gtgcttggag gactaccctt 60
 ttctcagat gcacaactta gtccacttt ttacagcaaa acgtgtccaa ctgttagttc 120

| | |
|---|------|
| cattgttagc aatgtcttaa caaacgtttc taagacagat cctcgcatgc ttgctagtct | 180 |
| cgtcaggctt cactttcatg actgttttgt tctgggatgt gatgcctcag ttttgcagaa | 240 |
| caatactgct acaatcgtaa gcgaacaaca agcttttcca aataacaact ctctaagggg | 300 |
| tttggatggt gtgaatcaga tcaaaactgc tgtagaaagt gcttgctcta acacagtttc | 360 |
| ttgtgctgat attcttgac ttgtcaagc atcctctgtt ctggcacaag gtcttagttg | 420 |
| gacggttctt ttaggaagaa gggatgggtt aaccgcaaac cgaacacttg caaatcaaaa | 480 |
| tcttcgggtt ccattcaatt ccttggatca ccttaaactg catttgactg ctcaaggcct | 540 |
| cattactcct gttctagttg cctctcggg tgctcataca tttggaagag ctcatcgcg | 600 |
| acaatttggt agtcgattgt acaacttcag cagtactgga agtcccgatc caactcttaa | 660 |
| cacaacttac ttacaacaac tgcgcacaat atgtcccaat ggtggacctg gcacaaacct | 720 |
| taccaatttc gatccaacga ctctgataa atttgacaag aactattact ccaatcttca | 780 |
| agtgaaaaag ggtttgctcc aaagtgatca agagttgttc tcaacttctg gtgcagatac | 840 |
| cattagcatt gtcgacaaat tcagcaccga tcaaaatgct ttctttgaga gctttaaggc | 900 |
| tgcaatgatt aaaatgggca atattgggtg gctaacaggg acaaaaggag agattagaaa | 960 |
| acaatgcaac tttgtgaact caaattctgc agaactagat ttagccacca tagcatccat | 1020 |
| agtagaatca ttagaggatg gaattgctag tgtaatataa ataaattagc gaaaatgcac | 1080 |
| ttattgaaat cttgtgacta gatccacta ataaataagt tataactagg cacatttcat | 1140 |
| gtcacttgaa atcctatgcc ttgtatatta gaggacgtgt tcttcttggt attatactat | 1200 |

<210> 14

<211> 1200

<212> DNA

<213> Medicago sativa

<400> 14

| | |
|--|-----|
| aatgcttggt ctaagtgcaa cagctttttg ctgtatgggtg tttgtgctaa ttggaggagt | 60 |
| acccttttca aatgcacaac tagatccttc attttacaac agtacatggt ctaatcttga | 120 |
| ttcaatcgta cgtgggtgtgc tcacaaatgt ttcacaatct gatcccagaa tgcttggtag | 180 |
| tctcatcagg ctacattttc atgactgttt tgttcaagggt tgcgatgcct cgattttgct | 240 |
| gaacgatagc gctacaatag tgagcgagca aagtgcacca ccaataaaca actccataag | 300 |

aggtttggat gtgataaacc agatcaaaac agcgggtggaa aatgcttgtc ctaacacagt 360
 ttcttgtgct gatattcttg ctctttctgc tgaaatatca tctgatctgg caaatgggtcc 420
 tacttggcaa gttccattag gaagaaggga tagtttgaca gcaaataatt cccttgcagc 480
 tcaaaatctt cctgccccca ctttcaacct tactcgacta aaatctaact ttgataatca 540
 aaacctcagt actaclgatc tagttgcact ctacaggtggc catacaattg gaagagggtca 600
 atgcagattt ttcgttgatc gattatacaa ttccagcaac actgggaaacc ccgattcaac 660
 tcttaacacg acctatttac aaacattgca agcaatatgt cccaatgggtg gacctgggtac 720
 aaacctaacc gatttggacc caaccacacc agatacattt gactccaact actactccaa 780
 tctccaagtt ggaaagggct tgtttcagag tgaccaagag cttttttcca gaaatgggtc 840
 tgacactatt tctattgtca atagtttcgc caataatcaa actctcttct ttgaaaattt 900
 tgtagcctca atgataaaaa tgggtaatat tggagtttta actggatctc aagggtgaaat 960
 tagaacacag tgtaatgctg tgaatgggaa ttcttctgga ttggctactg tagtcaccaa 1020
 agaatcatca gaagatggaa tggctagctc attctaaata taagcttgga aaatattgaa 1080
 gaggttctat aattttgtgc atacatatat ggtatgtgca tgtgggtgtat tatgtttttg 1140
 ttatgttctt caagttgatc agggactgta gaagctccct aataatattt gtgtcaaagt 1200

<210> 15

<211> 283

<212> PRT

<213> Glycine max

<400> 15

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Phe | His | Asp | Cys | Phe | Val | Gln | Gly | Cys | Asp | Gly | Ser | Val | Leu | Leu | Asn |
| 1 | | | | 5 | | | | 10 | | | | | | 15 | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | Thr | Asp | Thr | Ile | Glu | Ser | Glu | Gln | Asp | Ala | Leu | Pro | Asn | Ile | Asn |
| | | | 20 | | | | 25 | | | | | | 30 | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ser | Ile | Arg | Gly | Leu | Asp | Val | Val | Asn | Asp | Ile | Lys | Thr | Ala | Val | Glu |
| | | 35 | | | | | 40 | | | | | 45 | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | Ser | Cys | Pro | Asp | Thr | Val | Ser | Cys | Ala | Asp | Ile | Leu | Ala | Ile | Ala |
| | | 50 | | | | 55 | | | | | 60 | | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ala | Glu | Ile | Ala | Ser | Val | Ala | Gly | Arg | Arg | Ser | Gly | Trp | Pro | Val | Pro |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|

| | | | |
|---|-----|-----|-----|
| 65 | 70 | 75 | 80 |
| Leu Gly Arg Arg Asp Ser Leu Thr Ala Asn Arg Thr Leu Ala Asn Gln | | | |
| | 85 | 90 | 95 |
| Asn Leu Pro Ala Pro Phe Phe Asn Leu Thr Gln Leu Lys Ala Ser Phe | | | |
| | 100 | 105 | 110 |
| Ala Val Gln Gly Leu Asn Thr Leu Asp Leu Val Thr Leu Ser Gly Gly | | | |
| | 115 | 120 | 125 |
| His Thr Ser Gly Arg Ala Arg Cys Ser Thr Phe Ile Asn Arg Leu Tyr | | | |
| | 130 | 135 | 140 |
| Asn Phe Ser Asn Thr Gly Leu Ile His Leu Asp Thr Thr Tyr Leu Glu | | | |
| | 145 | 150 | 155 |
| Val Leu Arg Ala Arg Cys Pro Gln Asn Ala Thr Gly Asp Asn Leu Thr | | | |
| | 165 | 170 | 175 |
| Asn Leu Asp Leu Ser Thr Pro Asp Gln Phe Asp Asn Arg Tyr Tyr Ser | | | |
| | 180 | 185 | 190 |
| Asn Leu Leu Gln Leu Asn Gly Leu Leu Gln Ser Asp Gln Glu Arg Phe | | | |
| | 195 | 200 | 205 |
| Ser Thr Pro Gly Ala Asp Thr Ile Pro Leu Ser Ile Ala Ser Ala Asn | | | |
| | 210 | 215 | 220 |
| Gln Asn Thr Phe Phe Ser Asn Phe Arg Val Ser Met Ile Lys Met Gly | | | |
| | 225 | 230 | 235 |
| Asn Ile Gly Val Leu Thr Gly Asp Glu Gly Glu Ile Arg Leu Gln Cys | | | |
| | 245 | 250 | 255 |
| Asn Phe Val Asn Gly Asp Ser Phe Gly Leu Ala Ser Val Ala Ser Lys | | | |
| | 260 | 265 | 270 |
| Asp Ala Lys Gln Lys Leu Val Ala Gln Ser Lys | | | |
| | 275 | 280 | |

<210> 16

<211> 355

<212> PRT

<213> Medicago sativa

<400> 16

| | | | |
|---|---|---|----|
| Met Asn Ser Leu Arg Ala Val Ala Ile Ala Leu Cys Cys Ile Val Val | | | |
| | 1 | 5 | 10 |

Val Leu Gly Gly Leu Pro Phe Ser Ser Asn Ala Gln Leu Asp Pro Ser

20

25

30

Phe Tyr Arg Asn Thr Cys Pro Asn Val Ser Ser Ile Val Arg Glu Val
35 40 45

Ile Arg Ser Val Ser Lys Lys Asp Pro Arg Met Leu Ala Ser Leu Val
50 55 60

Arg Leu His Phe His Asp Cys Phe Val Gln Gly Cys Asp Ala Ser Val
65 70 75 80

Leu Leu Asn Lys Thr Asp Thr Val Val Ser Glu Gln Asp Ala Phe Pro
85 90 95

Asn Arg Asn Ser Leu Arg Gly Leu Asp Val Val Asn Gln Ile Lys Thr
100 105 110

Ala Val Glu Lys Ala Cys Pro Asn Thr Val Ser Cys Ala Asp Ile Leu
115 120 125

Ala Leu Ser Ala Glu Leu Ser Ser Thr Leu Ala Asp Gly Pro Asp Trp
130 135 140

Lys Val Pro Leu Gly Arg Arg Asp Gly Leu Thr Ala Asn Gln Leu Leu
145 150 155 160

Ala Asn Gln Asn Leu Pro Ala Pro Phe Asn Thr Thr Asp Gln Leu Lys
165 170 175

Ala Ala Phe Ala Ala Gln Gly Leu Asp Thr Thr Asp Leu Val Ala Leu
180 185 190

Ser Gly Ala His Thr Phe Gly Arg Ala His Cys Ser Leu Phe Val Ser
195 200 205

Arg Leu Tyr Asn Phe Ser Gly Thr Gly Ser Pro Asp Pro Thr Leu Asn
210 215 220

Thr Thr Tyr Leu Gln Gln Leu Arg Thr Ile Cys Pro Asn Gly Gly Pro
225 230 235 240

Gly Thr Asn Leu Thr Asn Phe Asp Pro Thr Thr Pro Asp Lys Phe Asp
245 250 255

Lys Asn Tyr Tyr Ser Asn Leu Gln Val Lys Lys Gly Leu Leu Gln Ser
260 265 270

Asp Gln Glu Leu Phe Ser Thr Ser Gly Ser Asp Thr Ile Ser Ile Val
275 280 285

Asn Lys Phe Ala Thr Asp Gln Lys Ala Phe Phe Glu Ser Phe Arg Ala
290 295 300

Ala Met Ile Lys Met Gly Asn Ile Gly Val Leu Thr Gly Asn Gln Gly
305 310 315 320

Glu Ile Arg Lys Gln Cys Asn Phe Val Asn Ser Lys Ser Ala Glu Leu

325

330

335

Gly Leu Ile Asn Val Ala Ser Ala Asp Ser Ser Glu Glu Gly Met Val
 340 345 350

Ser Ser Met
 355

<210> 17

<211> 358

<212> PRT

<213> Medicago sativa

<400> 17

Met Asn Ser Leu Ala Thr Ser Met Trp Cys Val Val Leu Leu Val Val
 1 5 10 15

Leu Gly Gly Leu Pro Phe Ser Ser Asp Ala Gln Leu Ser Pro Thr Phe
 20 25 30

Tyr Ser Lys Thr Cys Pro Thr Val Ser Ser Ile Val Ser Asn Val Leu
 35 40 45

Thr Asn Val Ser Lys Thr Asp Pro Arg Met Leu Ala Ser Leu Val Arg
 50 55 60

Leu His Phe His Asp Cys Phe Val Leu Gly Cys Asp Ala Ser Val Leu
 65 70 75 80

Leu Asn Asn Thr Ala Thr Ile Val Ser Glu Gln Gln Ala Phe Pro Asn
 85 90 95

Asn Asn Ser Leu Arg Gly Leu Asp Val Val Asn Gln Ile Lys Leu Ala
 100 105 110

Val Glu Val Pro Cys Pro Asn Thr Val Ser Cys Ala Asp Ile Leu Ala
 115 120 125

Leu Ala Ala Gln Ala Ser Ser Val Leu Ala Gln Gly Pro Ser Trp Thr
 130 135 140

Val Pro Leu Gly Arg Arg Asp Gly Leu Thr Ala Asn Arg Thr Leu Ala
 145 150 155 160

Asn Gln Asn Leu Pro Ala Pro Phe Asn Ser Leu Asp Gln Leu Lys Ala
 165 170 175

Ala Phe Thr Ala Gln Gly Leu Asn Thr Thr Asp Leu Val Ala Leu Ser
 180 185 190

Gly Ala His Thr Phe Gly Arg Ala His Cys Ala Gln Phe Val Ser Arg

195

200

205

Leu Tyr Asn Phe Ser Ser Thr Gly Ser Pro Asp Pro Thr Leu Asn Thr
 210 215 220

Thr Tyr Leu Gln Gln Leu Arg Thr Ile Cys Pro Asn Gly Gly Pro Gly
 225 230 235 240

Thr Asn Leu Thr Asn Phe Asp Pro Thr Thr Pro Asp Lys Phe Asp Lys
 245 250 255

Asn Tyr Tyr Ser Asn Leu Gln Val Lys Lys Gly Leu Leu Gln Ser Asp
 260 265 270

Gln Glu Leu Phe Ser Thr Ser Gly Ala Asp Thr Ile Ser Ile Val Asn
 275 280 285

Lys Phe Ser Thr Asp Gln Asn Ala Phe Phe Glu Ser Phe Lys Ala Ala
 290 295 300

Met Ile Lys Met Gly Asn Ile Gly Val Leu Thr Gly Thr Lys Gly Glu
 305 310 315 320

Ile Arg Lys Gln Cys Asn Phe Val Asn Phe Val Asn Ser Asn Ser Ala
 325 330 335

Glu Leu Asp Leu Ala Thr Ile Ala Ser Ile Val Glu Ser Leu Glu Asp
 340 345 350

Gly Ile Ala Ser Val Ile
 355

<210> 18

<211> 347

<212> PRT

<213> Medicago sativa

<400> 18

Met Trp Cys Val Val Leu Leu Val Val Leu Gly Gly Leu Pro Phe Ser
 1 5 10 15

Ser Asp Ala Gln Leu Ser Pro Thr Phe Tyr Ser Lys Thr Cys Pro Thr
 20 25 30

Val Ser Ser Ile Val Ser Asn Val Leu Thr Asn Val Ser Lys Thr Asp
 35 40 45

Pro Arg Met Leu Ala Ser Leu Val Arg Leu His Phe His Asp Cys Phe
 50 55 60

Val Leu Gly Cys Asp Ala Ser Val Leu Leu Asn Asn Thr Ala Thr Ile

| | | | |
|---|-----|-----|-----|
| 65 | 70 | 75 | 80 |
| Val Ser Glu Gln Gln Ala Phe Pro Asn Asn Asn Ser Leu Arg Gly Leu | | | |
| | 85 | 90 | 95 |
| Asp Val Val Asn Gln Ile Lys Thr Ala Val Glu Ser Ala Cys Pro Asn | | | |
| | 100 | 105 | 110 |
| Thr Val Ser Cys Ala Asp Ile Leu Ala Leu Ala Gln Ala Ser Ser Val | | | |
| | 115 | 120 | 125 |
| Leu Ala Gln Gly Pro Ser Trp Thr Val Pro Leu Gly Arg Arg Asp Gly | | | |
| | 130 | 135 | 140 |
| Leu Thr Ala Asn Arg Thr Leu Ala Asn Gln Asn Leu Pro Ala Pro Phe | | | |
| | 145 | 150 | 155 |
| Asn Ser Leu Asp His Leu Lys Leu His Leu Thr Ala Gln Gly Leu Ile | | | |
| | 165 | 170 | 175 |
| Thr Pro Val Leu Val Ala Leu Ser Gly Ala His Thr Phe Gly Arg Ala | | | |
| | 180 | 185 | 190 |
| His Cys Ala Gln Phe Val Ser Arg Leu Tyr Asn Phe Ser Ser Thr Gly | | | |
| | 195 | 200 | 205 |
| Ser Pro Asp Pro Thr Leu Asn Thr Thr Tyr Leu Gln Gln Leu Arg Thr | | | |
| | 210 | 215 | 220 |
| Ile Cys Pro Asn Gly Gly Pro Gly Thr Asn Leu Thr Asn Phe Asp Pro | | | |
| | 225 | 230 | 235 |
| Thr Thr Pro Asp Lys Phe Asp Lys Asn Tyr Tyr Ser Asn Leu Gln Val | | | |
| | 245 | 250 | 255 |
| Lys Lys Gly Leu Leu Gln Ser Asp Gln Glu Leu Phe Ser Thr Ser Gly | | | |
| | 260 | 265 | 270 |
| Ala Asp Thr Ile Ser Ile Val Asp Lys Phe Ser Thr Asp Gln Asn Ala | | | |
| | 275 | 280 | 285 |
| Phe Phe Glu Ser Phe Lys Ala Ala Met Ile Lys Met Gly Asn Ile Gly | | | |
| | 290 | 295 | 300 |
| Val Leu Thr Gly Thr Lys Gly Glu Ile Arg Lys Gln Cys Asn Phe Val | | | |
| | 305 | 310 | 315 |
| Asn Ser Asn Ser Ala Glu Leu Asp Leu Ala Thr Ile Ala Ser Ile Val | | | |
| | 325 | 330 | 335 |
| Glu Ser Leu Glu Asp Gly Ile Ala Ser Val Ile | | | |
| | 340 | 345 | |

<210> 19

<211> 351

<212> PRT

<213> Medicago sativa

<400> 19

Met Leu Gly Leu Ser Ala Thr Ala Phe Cys Cys Met Val Phe Val Leu
1 5 10 15
Ile Gly Gly Val Pro Phe Ser Asn Ala Gln Leu Asp Pro Ser Phe Tyr
20 25 30
Asn Ser Thr Cys Ser Asn Leu Asp Ser Ile Val Arg Gly Val Leu Thr
35 40 45
Asn Val Ser Gln Ser Asp Pro Arg Met Leu Gly Ser Leu Ile Arg Leu
50 55 60
His Phe His Asp Cys Phe Val Gln Gly Cys Asp Ala Ser Ile Leu Leu
65 70 75 80
Asn Asp Thr Ala Thr Ile Val Ser Glu Gln Ser Ala Pro Pro Asn Asn
85 90 95
Asn Ser Ile Arg Gly Leu Asp Val Ile Asn Gln Ile Lys Thr Ala Val
100 105 110
Glu Asn Ala Cys Pro Asn Thr Val Ser Cys Ala Asp Ile Leu Ala Leu
115 120 125
Ser Ala Glu Ile Ser Ser Asp Leu Ala Asn Gly Pro Thr Trp Gln Val
130 135 140
Pro Leu Gly Arg Arg Asp Ser Leu Thr Ala Asn Asn Ser Leu Ala Ala
145 150 155 160
Gln Asn Leu Pro Ala Pro Thr Phe Asn Leu Thr Arg Leu Lys Ser Asn
165 170 175
Phe Asp Asn Gln Asn Leu Ser Thr Thr Asp Leu Val Ala Leu Ser Gly
180 185 190
Gly His Thr Ile Gly Arg Gly Gln Cys Arg Phe Phe Val Asp Arg Leu
195 200 205
Tyr Asn Phe Ser Asn Thr Gly Asn Pro Asp Ser Thr Leu Asn Thr Thr
210 215 220
Tyr Leu Gln Thr Leu Gln Ala Ile Cys Pro Asn Gly Gly Pro Gly Thr
225 230 235 240
Asn Leu Thr Asp Leu Asp Pro Thr Thr Pro Asp Thr Phe Asp Ser Asn
245 250 255
Tyr Tyr Ser Asn Leu Gln Val Gly Lys Gly Leu Phe Gln Ser Asp Gln

260

265

270

Glu Leu Phe Ser Arg Asn Gly Ser Asp Thr Ile Ser Ile Val Asn Ser
 275 280 285

Phe Ala Asn Asn Gln Thr Leu Phe Phe Glu Asn Phe Val Ala Ser Met
 290 295 300

Ile Lys Met Gly Asn Ile Gly Val Leu Thr Gly Ser Gln Gly Glu Ile
 305 310 315 320

Arg Thr Gln Cys Asn Ala Val Asn Gly Asn Ser Ser Gly Leu Ala Thr
 325 330 335

Val Val Thr Lys Glu Ser Ser Glu Asp Gly Met Ala Ser Ser Phe
 340 345 350

<210> 20

<211> 22

<212> DNA

<213> Medicago sativa

<400> 20

taaaatcata tcagcttact cc